The data recovery investigations proposed for the Horsetooth Safety of Dams project proceed from, and are interpreted within, a context that includes the natural and cultural settings. The individuals who created and used the three sites were products of their cultural heritage and manipulated their environment in a manner consistent with that heritage. Descriptions of the natural and cultural settings help to understand this adaptive process.

2.1 NATURAL SETTING

Characteristics of the local environment are thoroughly described in the Horsetooth Reservoir Pool Area Final Cultural Resources Inventory report (Mutaw 2001). Unless otherwise noted, the information presented below comes from that document.

Figure 2-1. Overview of Horsetooth Reservoir in 2000, Looking South from Horsetooth Dam.

2.1.1 Physiography

The project area is located along the eastern flank of the Front Range of the Southern Rocky Mountains. The uplift of this range resulted in tilted layers of Paleozoic and Mesozoic sandstones that form hogback ridges, the dominant topographic feature in the project area. The area is distinguished by north-south trending hogbacks, separated by erosional valleys, sometimes called glades. Horsetooth Reservoir is located in one of these valleys between two hogbacks (Figure 2-1). The normal pool elevation of Horsetooth Reservoir is 5430 ft. amsl, while the tops of the surrounding hogbacks have a maximum elevation of about 5800 ft. amsl.

2.1.2 Geology

The primary geological structure underlying the project area consists of uptilted Paleozoic and Mesozoic sedimentary deposits (Chronic and Chronic 1972). These deposits are divided into a series of formations that outcrop west to east across the project area. The Fountain and Ingleside formations are calcareous sandstones and limestones of Pennsylvanian to Permian ages. The Santanka, Lyons, and Lykins formations are siltstones, sandstones, and shales of Permian to Triassic ages. The Lyons formation forms the western containment of Horsetooth Reservoir. Directly underlying the reservoir is the Lykins formation. This shale deposit is often heavily eroded, resulting in steep "strike valleys." It is this type of valley that provides the pool for Horsetooth Reservoir. The Sundance, Morrison, and Dakota formations are claystones, siltstones, and sandstones of Jurassic to Cretaceous ages. The Dakota formation, along with the three dams, provides the eastern containment of the reservoir. The Niobrara and Benton formations comprise the Colorado Group, which consists of Cretaceous-age sandstones and shales (Tweto 1971; Chronic and Chronic 1972). The foothills to the west are composed of Precambrian igneous and metamorphic rocks, including various gneisses, schists, migmatites, and granites. Alluvial processes have deposited older materials along the local drainages.

2.1.3 Soils

The geological deposits, in combination with the climate, have created the soils found in the project area. The local soils include two associations (Moreland 1980). On the western side of Horsetooth Reservoir is the Kirtley-Purner-Haplustolls association, while the Haplustolls-Baller-Rock outcrop association dominates the eastern side. The Kirtley-Purner-Haplustolls association consists of soils formed in materials weathered from sandstone. Kirtley soils are well-drained, gently to moderately sloping loams. Purner soils are well-drained, nearly level to steep, fine sandy loams. Haplustolls soils are strongly sloping to steep, loams to clay loams. The Haplustolls-Baller-Rock outcrop association consists of soils formed in materials weathered from sandstone. Baller soils are well-drained, strongly sloping to steep, stony sandy loams. Rock outcrop areas consist of exposed sandstone bedrock and are usually found in the steeper areas of the association.

2.1.4 Drainage

The major perennial drainage in the area is the Cache la Poudre River, located a few miles north of Horsetooth Reservoir. Its headwaters are near Milner Pass in Rocky Mountain National Park, at an elevation of approximately 10,800 ft. (McWilliams and McWilliams 1995: 53). The river flows east and southeast for well over 100 mi., eventually joining the South Platte River about five miles east of Greeley. Six named intermittent drainages are found within the project area: Soldier Canyon, Well Gulch, Arthurs Rock Gulch, Mill Creek, Dixon Creek, and Spring Creek. All of these drainages flow northeast and enter the project area from the foothills to the west. All were once tributaries of the Cache la Poudre River, but they now drain directly into Horsetooth Reservoir.

2.1.5 Modern Climate

The project area enjoys the mild, sunny, semiarid climate that prevails over much of the foothills east of the Southern Rocky Mountains (Moreland 1980). During the summer, afternoon clouds shade the area, resulting in relatively few days of extreme heat. In the winter, the high elevation and the presence of the mountains to the west combine to moderate cold temperatures. Cold air masses from Canada often veer eastward when they reach the mountains because they cannot rise in elevation. The mountains also block cold air masses coming from the west. Chinook winds occur frequently, raising local temperatures to above normal levels, resulting in a relatively temperate winter. Extreme cold spells do occur, but they are usually of short duration.

The region is generally characterized by generous sunshine, little precipitation except in spring, comfortable daytime temperatures much of the year, low daytime humidity, and abrupt weather changes with sometimes heavy snows or violent thunderstorms. As measured at Ft. Collins for the period 1900-2000 (Western Regional Climate Center 2001), the average annual temperature is 48.0°F, ranging from 27.1°F in January to 70.3°F in July (Figure 2-2). The average annual precipitation is 15.15 inches, with a low of 0.37 inches in January to a high of 2.80 inches in May (Figure 2-3). Mean annual snowfall is 47.1 inches, with the greatest amount (10.1 inches) falling in March.

According to Doesken (2000), notable climatic events in Ft. Collins include major floods on the Poudre River in 1864, 1904, 1923, 1938, 1983, 1997, and 1999, and significant droughts in 1893, 1930s, 1966, and 1972-1977 (Horsetooth Reservoir was nearly empty during this last period). The wettest and driest years were, respectively, 1961 (28.43 inches) and 1966 (7.34 inches).

2.1.6 Flora

Local flora includes short grasses, mountain mahogany, thread-leaved sagebrush, skunkbush, prickly pear cactus, yucca, squawbush, juniper, pinyon pine, and a variety of forbs. Cottonwood and willow are found along drainages and at the high water line along the reservoir, while Ponderosa pine occurs along the hogback ridgetops.

2.1.7 Fauna

A wide range of wildlife is present in the project area. The dominant species are mule deer, pronghorn, coyote, fox, skunk, whitetail jackrabbit, cottontail rabbit, and various types of burrowing rodents, such as the prairie dog. Buffalo and elk inhabited the area until early historic times. Avian species presently include many raptors, such as the red-tailed hawk, and other birds such as the mourning dove, magpie, crow, horned lark, lark bunting, and meadow lark. Reptiles represented are the western rattlesnake, bullsnake, and various lizards.

Figure 2-2. Summary of Average Monthly Temperatures for Ft. Collins, 1900-2000

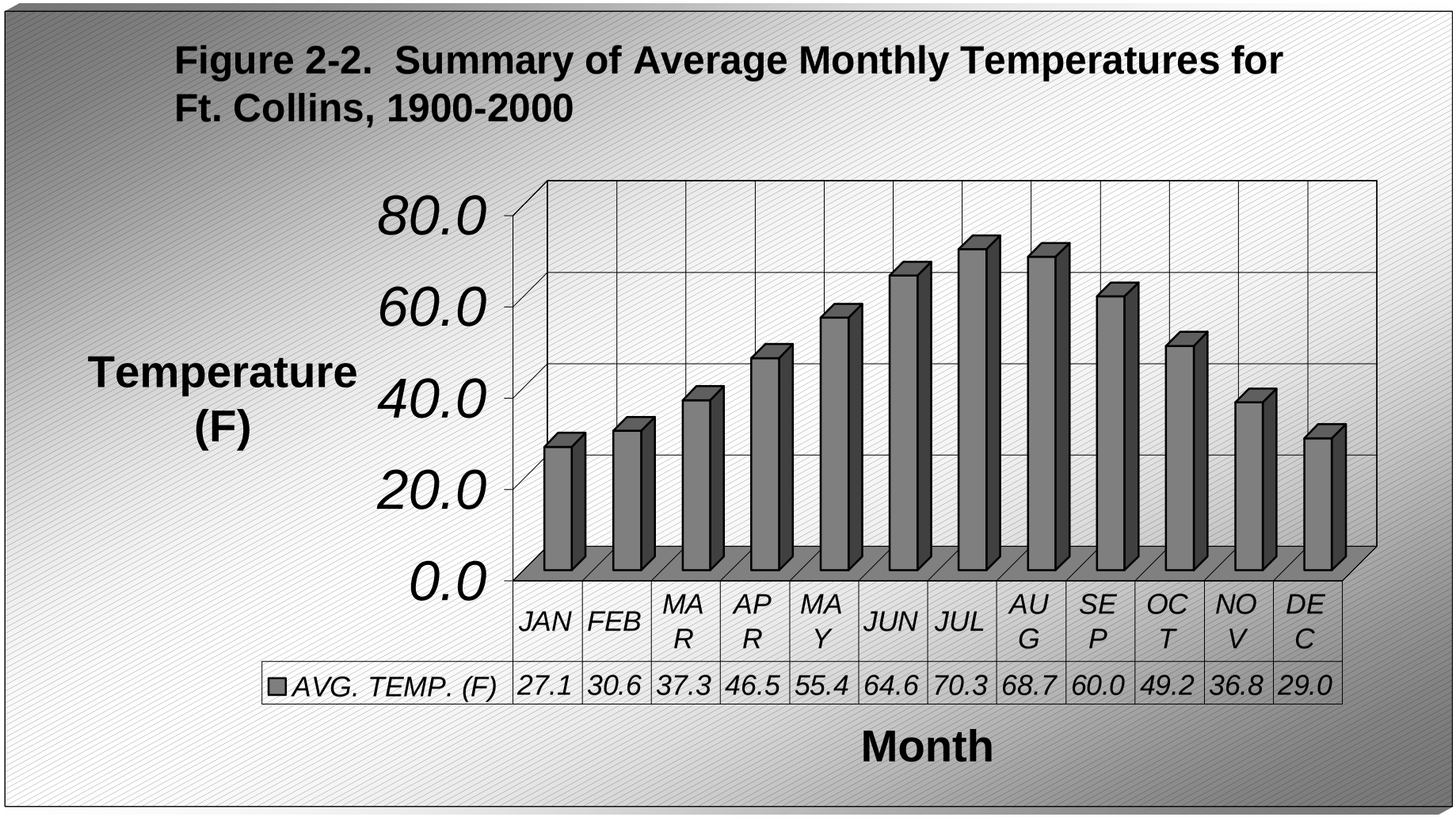
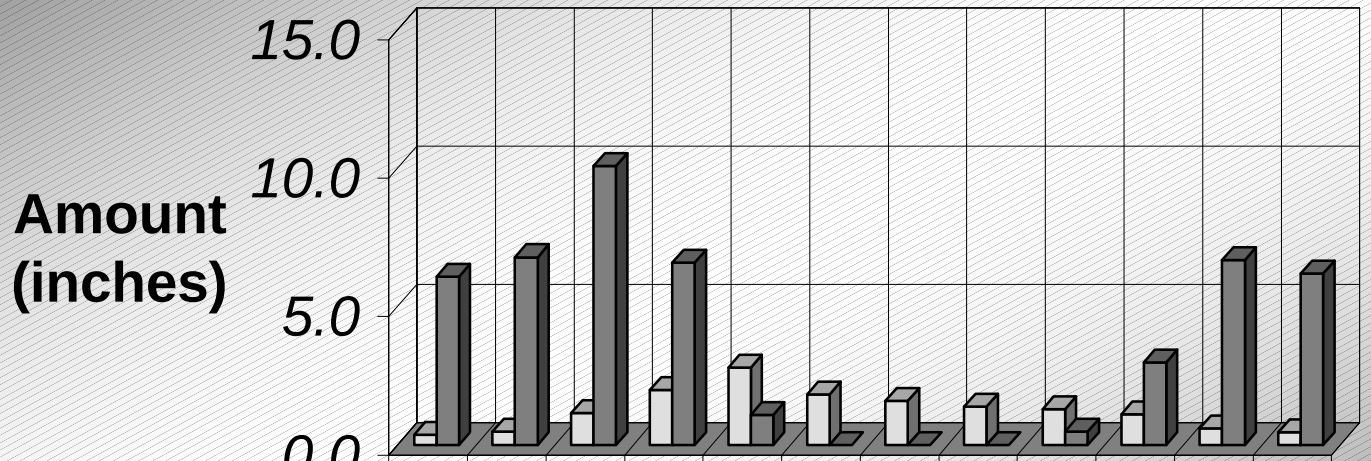


Figure 2-3. Summary of Average Monthly Precipitation and Total Snowfall for Ft. Collins, 1900-2000



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Precipitation	0.37	0.49	1.16	2.00	2.80	1.83	1.60	1.40	1.31	1.11	0.60	0.47
Total Snowfall	6.1	6.8	10.1	6.6	1.1	0.0	0.0	0.0	0.5	3.0	6.7	6.2

Month

2.2 CULTURAL SETTING

The project area lies at the interface between the mountain foothills and the open plains. As such, its culture history reflects the influence of both natural areas. Humans have inhabited northeastern Colorado for at least 10,000 years (Gilmore et al. 1999). For the vast majority of this lengthy span of time, indigenous groups (i.e., Native Americans) pursued a general lifestyle of gathering and hunting. Evidence of their presence is reflected in varying-sized concentrations of artifacts, mostly chipped stone, of different ages and found in a variety of environmental settings. Sustained non-native presence in the area is much more recent, however, dating to the middle nineteenth century. This project focuses attention upon three sites of this latter period.

2.2.1 Historic Context

The following socioeconomic themes are relevant to the current project (Mehls1984a; Mutaw et al. 1990, 1991): Quarrying, Mining, and the Community of Stout (A.D. 1870-1920); Farming and Ranching (A.D. 1860-1940); and Irrigation and the Colorado-Big Thompson Project (A.D. 1859-1959). Much of the following discussion has been excerpted from Mutaw (2001).

2.2.1.1 Quarrying, Mining, and the Community of Stout, 1870-1920

The creation of the Fort Collins Agricultural Colony in 1872 stimulated the development of the area. As the demand for commercial buildings and residences accelerated, early builders hauled sandstone by wagon from the nearby hogbacks to Fort Collins. In 1873, A. K. Yount built the door and windowsills and lintels of his downtown commercial block of white sandstone. Franklin C. Avery trimmed his residence with red sandstone. Places as far away as Denver began to use the stone deposits, notably for the kitchen floor of that city's Windsor Hotel, constructed in 1880 (Bucco 1974: 318; Brettell 1973). In 1880, twenty carloads of white sandstone were being hauled to the Central Colorado tracks and sent from the valley weekly to be used in the construction of Denver's railroad depot (Bucco 1974: 318)

Although quarrying took place during the 1870s, major development of the area awaited the arrival of rail transportation, which made large shipments of stone a feasible proposition. The planned Greeley, Salt Lake and Pacific (GSL&P) railway through Larimer County spurred the development of the quarries by local individuals and companies. By the close of 1881, almost a dozen quarries were in operation and several of these rushed to meet an increasing flood of orders. The Eclipse Stone Quarry, located within the reservoir area, had contracts for sidewalks in Fort Collins. The quarry operated by John J. and Robert W. Bradley was shipping three-by-nine foot blocks for use in Horace Tabor's Grand Opera House in Denver (Bucco 1974: 320).

In 1881, the same year the railroad was announced, William N. Bachelder's Fort Collins Flagstone Company selected a quarry site in Spring Canyon and built a five-hundred-foot, double track tramway to the quarry area (Bucco 1974: 319). Bachelder, an extensive landholder in Spring Canyon, had moved to the area in 1871 and began raising sheep. When the boom in quarrying began in the area, he became a major leader in the industry. By 1882, he was operating ten quarry sites, some of which are located within the reservoir area, and shipping eight thousand dollars worth of stone each month during the summer. Bachelder was also

responsible for the first efforts to turn the quarry area into a town. He built a large store and established a post office named Petra in the midst of the mining camp (Bucco 1974: 321).

Many of the smaller quarries in the area were family-run businesses. While other quarry workers, such as John T. Cliff, owner of the Eclipse Stone Quarry, had built residences in the valley, one of the most important symbols of permanence came with the construction of a schoolhouse. In 1882, Charles C. Smith, owner of the Highland Stone Quarry, built and supplied a frame school and hired a teacher. The Highland School served School District Number 27, which was formed in 1882. The following year, M. Thomas built a stone schoolhouse to replace the earlier frame version (Bucco 1974:322). The schoolhouse served as the center of community activities, holding debates, court sessions, church services, and entertainment events. By March 1885, enrollment had increased to the extent that an addition was added to the building. The schoolhouse remained in the valley until construction of the reservoir, during which time it was used as a project headquarters. The schoolhouse ruins are located within the reservoir area.

In 1882, William H.B. Stout leased the Union Pacific quarries and began to work them, thus becoming the major operator in the area. Stout built a two-story, stone boarding house west of the railroad depot. The boarding house, the dimensions of which were 53 ft. by 60 ft, had 21 rooms, including an office, dining room, kitchen, basement, pantry, and post office. In September 1882, the Stout post office replaced the operations of the Petra post office (Bucco 1974: 322, 325). As the town grew, the community also encompassed a feed store, two blacksmith shops, a wheelwright shop, a livery stable, three saloons, and a brothel (Fort Collins Triangle Review 23 February 1983). This site is located south of the reservoir, and the shell of the boarding house is still standing.

William Stout was an experienced contractor and, with the influence of the railroad, was successful in winning large contracts for his quarries. In addition to supplying the railroad's needs, Stout provided the flagging for the Arapahoe County Courthouse walk, and the stone for Frank P. Stover's building in Fort Collins and steam flour mill in Denver. Stout also supplied the foundation stone for the Mechanics Hall at the Colorado Agricultural College in Fort Collins, and shipped stone to Kansas City and Omaha (Bucco 1974:324, 326).

The small quarry owners were threatened by Stout's success. In 1882, 21 of these operators asked the Union Pacific to build sidetracks to their quarries. Some quarrymen, such as William Bachelder, left the business during this period. Others, including Charles C. Smith, continued to operate. Smith built stone houses for 50 workmen and constructed a model stone residence to publicize his resource. This site was probably located within the reservoir area. In 1884, the railroad constructed a sidetrack in Spring Canyon and offered to buy stone loaded there, thus keeping a few private quarries in operation (Bucco 1974: 327).

Although William Stout was running the largest operation in the valley, several factors led to his decision to quit the quarry. Quarry operators needed skilled masons to work their quarries. Stout hired mostly Swedish quarrymen, who resided at his boarding house. In 1883, these men went on strike. His brother, Homer D. Stout, who acted as postmaster, died that same year. At this time, William Stout asserted that his agreement with the Union Pacific, which required him to supply the railroad before his other customers, was not profitable. Stout and his remaining family soon left the area (Bucco 1974: 326-327).

Some of Stout's employees stayed to run the quarries for the Union Pacific. Henry C. Lett was hired as superintendent of the operation, and he set about publicizing the area's stone. Lett

opened a new quarry to supply paving stone for Omaha, Nebraska, a state in which he had once been a candidate for governor. Under Lett's direction, the stone department of the Union Pacific opened new quarries to extract foundation stone for the State Capitol (Bucco 1974: 328). In 1886, the Union Pacific added a new switch and a sidetrack at Stout, announcing an order for 300 cars of foundation stone for the Capitol (Bucco 1974: 329).

In 1886, the Fort Collins Red Stone Company was organized near Bellvue. A company town was established and divided into lots for worker's cottages. This company suffered financial difficulties and its brown sandstone quarries near Rist Canyon went through several owners before being purchased by the American Red Stone Company, which employed Chicagoans to run the quarries. Subsequently, stone was shipped daily to Chicago (Bucco 1974: 331).

In 1887, the Union Pacific announced that it would give up its competition for stone contracts and hired A.C. Beckwith to run the quarries. In 1890, the Colorado Central merged with other railroads to form the Union Pacific, Denver and Gulf (UPD&G) Railway Company. Independent quarrymen were now able to obtain contracts previously filled by the railroad (Bucco 1974: 330).

The Panic of 1893 resulted in widespread economic dislocation in Colorado and had a profound impact on the stone business in Stout. Big markets for stone, such as the City of Denver, were thrown into a building slump that lasted for several years. At this time, the GSL&P Railroad halted freight service between Greeley and Stout. Railway mail service was also discontinued, and the population of Stout decreased dramatically (Bucco 1974: 332).

A few hardy entrepreneurs remained, however, and prepared for the building revival that they thought was sure to come. William H. Harvey purchased the original Bachelder quarry and operated the tramway. Renaming the area Braidwood, Harvey offered optimism about the area's future, but did not extract much stone (Bucco 1974: 332). By 1896, activity at Stout had begun to resume in a small way and the population of the town began to increase. A new demand for building, curbing, and flagging stone motivated the railroad to make repairs along the Stout branch.

An inventory of materials and tools taken at Stout in 1894 reveals that the Union Pacific still maintained ample stock at that location. The inventory accounted for materials at the South Quarry, North Quarry, and Moon Stone-North Quarry. Supplies of stone on hand at that point included dimension stone, flagging, sills, curbing, and paving blocks. Tools stored there included push cars, dump boxes, stone picks, wheelbarrows, drills, derricks, hoists, and stone crushers. Total assets were $9,239.85 (Colorado Historical Society 1894, Manuscript Collection 908). In 1898, the State Bureau of Mines reported that, for the previous year, active quarries at Stout included the one operated by Gray for the Union Pacific and those operated by Carlson and Frey. In addition, the report mentioned the Peterson Limestone Quarry near Stout and the American Red Sandstone Company at Bellvue (Colorado Bureau of Mines 1898: 143). Both of these quarries are located outside the reservoir area.

Around 1900, Fort Collins businessmen Hale and Brunton started a quarry a few miles north of Stout with operations on two levels and six pole derricks to lift stone. This quarry is believed to be located within the reservoir area. The stone was hauled to a small mill in Horsetooth Glade, where steam-powered saws were used to cut the stone for shipment (Fort Collins Triangle Review, 11 October 1978). In 1911, Hale and Brunton were bought out by Fort Collins mayor Jesse Harris and some Denver businessmen, who formed the Colorado Red Sandstone Company

and continued to operate the quarries. Stone from the company's quarries was used in building three structures at the University of Colorado in Boulder, as well as the Carnegie Library and Masonic Temple in Fort Collins (Fort Collins Triangle Review 11 October 1978).

But the halcyon days of stone extraction were over for the area, and the quarries never returned to the levels of previous production. Rubble became the major product of the quarries for a while, and Stout flagging was touted as a sidewalk material. By 1892, however, Denver began to pave with asphalt, and concrete began to take pre-eminence as a sidewalk, curbing, and foundation material (Bucco 1974: 333). Although orders for stone continued to be taken, most quarry owners turned to other occupations, extracting stone only upon demand.

Although the stone industry declined dramatically at Stout, the town lived on for a time. In 1900, the Stout vicinity had a population of 250 (Colorado State Business Directory 1901). When the use of stone as a building material declined, the railroad began to question the necessity of operating the Stout branch. In 1905, three miles of track were taken up and the depot was abandoned. Four miles of track were removed in 1909; by 1918, only the switch and a short siding remained at Bellvue. The portion of the GSL&P from Bellvue to Fort Collins became part of the Colorado and Southern Railway in 1917 (Fort Collins Triangle Review 12 January 1977). By 1910, the population had once more taken a sharp downward turn (U.S. Census 1910).

2.2.1.2 Farming and Ranching, 1860-1940

By the early 1860s, settlers had taken up all the bottomlands along the Cache La Poudre River. Under cultivation, these farms yielded enormous crops of hay, grain, and vegetables (Watrous 1911: 227). Although Larimer County was not directly involved in mining gold during this period, local farmers found waiting markets for their products in Denver and the mining camps. Early production was confined to raising vegetables and grains for personal use and cutting native grasses for hay (Watrous 1911: 52). By 1867, however, farming had become an important industry in the region, evidenced by the building of mills to process grains (Watrous 1911: 52). Until 1877 and the introduction of alfalfa, most farmers raised small grains such as wheat, oats or barley (Watrous 1911: 136).

Stock raising became an important activity in the county during the 1860s and 1870s, when ranchers took advantage of the rich grazing lands available (Watrous 1911: 53). Surveying the western portion of Township 7 North, Range 69 West in 1877, Hiram Witter declared that the soil in the valleys was good and that grass grew "luxuriantly" there. The surveyor also noted that much of the land was used for sheep ranges (USDI Bureau of Land Management, Survey Field Notes, Witter 1877). Further north and west, in Township 7 North, Range 70 West, Surveyor George Hill recorded that the land was mountainous, except for small open valleys along the creeks. He noted a number of farming and stock ranches along these creeks (USDI Bureau of Land Management, Survey Field Notes, Hill 1882).

William Bachelder, a native of Vermont, settled in Spring Canyon in 1871 and began raising large flocks of sheep. Bachelder found that the area had ample grass and water for his flocks, and he was able to profit from the selling of wool. His success encouraged others to raise similar flocks and until about 1885, sheep raising and wool growing were important elements of the local economy. The Larimer County Stock Growers' Association was organized in 1884.

However, as more farmers entered the area, the range became restricted and many moved their large herds to Wyoming (Watrous 1911: 135).

The value of cattle and horses declined sharply between 1885 and 1890, and many ranchers turned to a new industry, sheep feeding (Watrous 1911: 251). In 1889, E. J. and I. W. Bennett shipped lambs to Fort Collins for fattening, an activity which was to boom in subsequent years (Watrous 1911: 136). This industry was a boon to the agricultural economy of the county. It allowed farmers to use surplus alfalfa, coarse grain, and sugar beet pulp. It also provided a natural fertilizer and resulted in added income (Watrous 1911: 151, 251).

During the 1860s and 1870s, many settlers homesteaded in Pleasant Valley, east of the future site of Bellvue (Hutchinson 1983). In 1862, Abner Loomis brought fruit trees to Larimer County and planted them in that area (Watrous 1911: 143). The town of Bellvue, about two miles north of Horsetooth Reservoir, was platted in 1882 by B. F. Flowers, a homesteader. Soon, many farmers and fruit growers entered the area (Hutchinson 1983).

Land entry records maintained by the Bureau of Land Management indicate that the land now occupied by Horsetooth Reservoir was taken up slightly later than the area around Bellvue. Historical land patents for the Horsetooth Reservoir area are summarized in Table 2-1 and graphically illustrated in Figure 2-4. William N. Bachelder obtained the earliest patent in the area by cash entry on October 30, 1874, for 80 acres in the SE¼SW¼ and SW¼SE¼ of Section 20, near the future site of Dixon Canyon Dam. The 1880s witnessed an upsurge in the number of patents issued (27 percent of the total), most of them cash entry. A large number (44 percent) of the patents, most of them homestead entry, for thousands of acres in and around the reservoir, were issued in the 1890s, especially 1890 and 1891. Assuming that a homesteader took the usual five years to prove up a claim, it can be inferred that most of the earliest successful homesteads in the area were established in the mid-1880s. After 1900, the number of land patents declined significantly. The last patent—a homestead entry—was filed on April 20, 1931.

Eugene Lamb obtained a cash entry patent (No. 117524) on March 10, 1910, for a 120-acre parcel at Eltuck Bay where Site 5LR9949 is located. On October 29, 1888, Annie C. Kane was issued a cash entry patent (No. 40456) for 80 acres, which encompasses the location of Site 5LR9961. Stephen A. Wathen acquired a homestead entry patent (No. 40544) on October 23, 1894, for 168.16 acres in Inlet Bay where Site 5LR9974 is located.

TABLE 2-1
HISTORICAL LAND PATENTS IN HORSETOOTH RESERVOIR AREA

Patent No.	Date	Legal Subdivision					Size (Acres)	Patentee	Kind Of Entry	Authority
		T	R	Sec.	¼	¼				
188127	4/5/1911	7N	69W	6	SE	NW	161.48	Edward L. McCabe	Homestead Entry	12 Stat. 392 (May 20, 1862)
					NE	SW				
					SW	NW				
					NW	SW				
39842	1/15/1890	7N	70W	1	E	SW	160	Ole Sorenson	Cash Entry	3 Stat. 566 (April 24, 1820)
					W	SE				
399036	4/18/1914	7N	69W	6	SE	SW	161.12	Josephine Campeau, Josephine McCabe	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SW	SW				
		7N	69W	7	NE	NW				
		7N	70W	1	SE	SE				
39838	6/14/1889	7N	69W	7	NW	NW	161.39	William Puckett	Cash Entry	3 Stat. 566 (April 24, 1820)
		7N	70W	12	E	NE				
					NE	SE				
40454	10/29/1888	7N	69W	7		NE	160	John N. Puckett	Cash Entry	3 Stat. 566 (April 24, 1820)
40491	6/5/1890	7N	69W	7	SE	NW	163.7	Frank Lamb	Homestead Entry	12 Stat. 392 (May 20, 1862)
					NE	SW				
					SW	NW				
					NW	SW				
40587	4/9/1901	7N	69W	7	NW	SE	40	Jonas Finger	Cash Entry	3 Stat. 566 (April 24, 1820)
483026	7/20/1915	7N	69W	7	SW	SE	40	Edward McCabe	Cash Entry	3 Stat. 566 (April 24, 1820)
40453	3/17/1888	7N	69W	7	SW	SW	127.7	Thomas Cramer	Cash Entry	3 Stat. 566 (April 24, 1820)
					NW	NW				
					SW	NW				
117524	3/10/1910	7N	70W	12	SE	SE	40	Eugene Lamb	Homestead Entry	12 Stat. 392 (May 20, 1862)
40476	12/13/1889	7N	69W	7	SE	SW	120	Frank L. Neff	Cash Entry	3 State. 566 (April 24, 1820)
				18	E	NW				

TABLE 2-1. Continued.

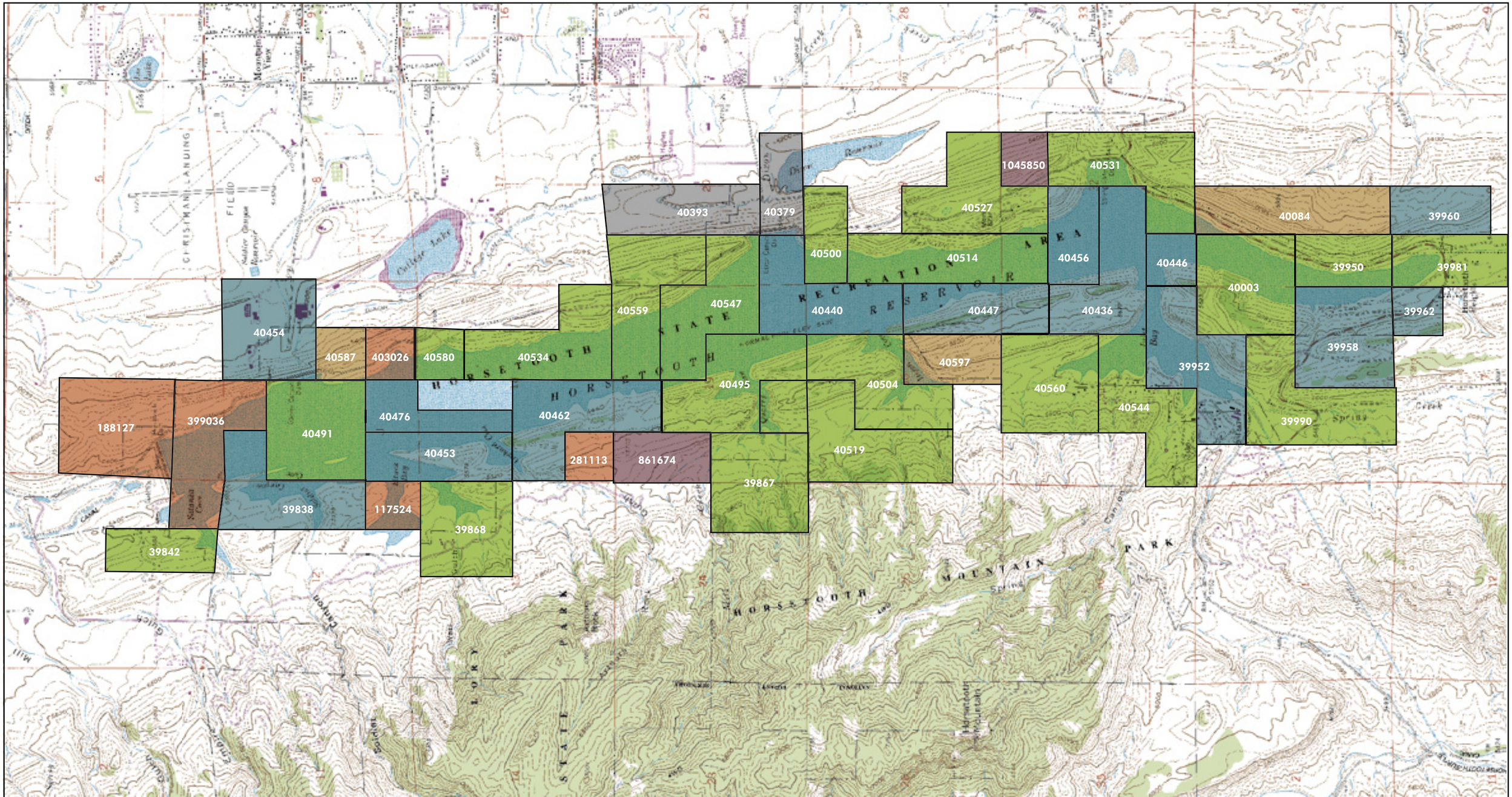
Patent No.	Date	Legal Subdivision					Size (Acres)	Patentee	Kind Of Entry	Authority
		T	R	Sec.	¼	¼				
39868	12/12/1891	7N	70W	13		NE	160	John Kimmons	Homestead Entry	12 Stat. 392 (May 20, 1862)
40580	2/25/1899	7N	69W	18	NW	NE	40	William Metcalf	Cash Entry	3 Stat. 566 (April 24, 1820)
40462	7/12/1889	7N	69W	18	E	SW	163.06	John J. Bradley	Homestead Entry	12 Stat. 392 (May 20, 1862)
					NW	SW				
				19	NE	NW				
231113	10/19/1911	7N	69W	18	SW	SW	43.3	John A. Howard	Cash Entry	3 Stat. 566 (April 24, 1820)
40534	7/19/1893	7N	69W	18	W	SE	160	Henry Marschal	Cash Entry	3 Stat. 566 (April 24, 1820)
					SW	NE				
					SE	SE				
861674	5/3/1922	7N	69W	19	NW	NW	87.68	Eugene Lamb	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SW	NW				
40539	7/2/1894	7N	69W	19	N	NE	160	Jason L. Lamb	Homestead Entry	12 Stat. 392 (May 20, 1862)
				20	W	NW				
40547	2/11/1895			19	S	NE	160	Charles E. Carey	Homestead Entry	12 Stat. 392 (May 20, 1862)
		7N	69W		NE	SE				
				20	NW	SW				
40495	9/23/1890	7N	69W	19	W	SE	160	Alexander Chisholm	Cash Entry	12 Stat. 566 (April 24, 1820)
					SE	NW				
					NE	SW				
39867	8/24/1891	7N	69W	19	NW	SW	169.36	George W. Bealmear	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SW	SW				
				24	E	SE				
40513	6/4/1891	7N	69W	19	SE	SW	40	Robert Wall	Cash Entry	12 Stat. 566 (April 24, 1820)
40519	8/24/1891	7N	69W	30	NE	NW	176.8	Morgan O. Dwyer	Homestead Entry	12 Stat. 392 (May 20, 1862)
					NW	NW				
					SW	NW				
					NW	SW				

TABLE 2-1. Continued.

Patent No.	Date	Legal Subdivision					Size (Acres)	Patentee	Kind Of Entry	Authority
		T	R	Sec.	¼	¼				
40440	11/10/1882	7N	69W	19	SE	SE	160	Albert Steffens	Cash Entry	12 Stat. 566 (April 24, 1820)
				20	SW	SW				
				30	E	NE				
40379	10/30/1874	7N	69W	20	SE	SW	80	William N. Bachelder	Cash Entry	12 Stat. 566 (April 24, 1820)
					SW	SE				
40393	4/1/1875	7N	69W	20	E	NW	120	William N. Bachelder, Noah J. Ellis	Scrip or Nature of Scrip	5 Stat. 607 (March 17, 1842)
					NE	SW				
40504	12/9/1890	7N	69W	30	W	NE	160	Frank J. Lesher	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SE	NW				
					NE	SW				
40500	12/6/1890	7N	69W	29	N	NW	80	William Wall	Cash Entry	12 Stat. 566 (April 24, 1820)
40527	3/17/1892	7N	69W	29	E	SW	160	Norman B. Dawley	Cash Entry	12 Stat. 566 (April 24, 1820)
					SW	SE				
				32	NE	NW				
40514	7/14/1891	7N	69W	29	W	SW	160	Orestes Lord	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SW	NW				
				32	NW	NW				
40447	9/10/1886	7N	69W	30	E	SE	120	Orestes Lord	Cash Entry	12 Stat. 566 (April 24, 1820)
				31	NE	NE				
40597	11/22/1904	7N	69W	30	W	SE	80	Fred O. Herrington	Cash Entry	12 Stat. 566 (April 24, 1820)
40560	5/29/1896	7N	69W	31	W	NE	160	Eliza A. Herrington	Homestead Entry	12 Stat. 392 (May 20, 1862)
					E	NW				
40436	7/25/1882	7N	69W	31	SE	NE	160	Sidney A. Miller	Cash Entry	12 Stat. 566 (April 24, 1820)
					NE	SE				
				32	N	SW				
40456	10/29/1888	7N	69W	32	S	NW	80	Annie C. Kane	Cash Entry	12 Stat. 566 (April 24, 1820)

TABLE 2-1. Concluded.

Patent No.	Date	Legal Subdivision					Size (Acres)	Patentee	Kind Of Entry	Authority
		T	R	Sec.	¼	¼				
74000	2/1/1893	7N	69W	32	W	SE	160	Thomas Geary	Homestead Entry	12 Stat. 392 (May 20, 1862)
					SW	NE				
					SE	SW				
40446	9/10/1886	7N	69W	32	SW	SW	40	John T. Cliff	Cash Entry	12 Stat. 566 (April 24, 1820)
39952	12/10/1881	7N	69W	31	S	SE	160.8	Henry Wood	Cash Entry	12 Stat. 566 (April 24, 1820)
		6N	69W	6	NW	NE				
					NE	NW				
40544	10/23/1894	7N	69W	31	E	SW	168.16	Stephen A. Wathen	Homestead Entry	12 Stat. 392 (May 20, 1862)
					NW	SE				
					SW	SW				
40005	3/30/1891	6N	69W	5	SW	NW	161.39	Augusta E. Cavenaugh	Cash Entry	12 Stat. 566 (April 24, 1820)
					NW	NW				
				6	SE	NE				
					NE	NE				
40084	5/27/1907	6N	69W	5	E	SW	160.68	Thomas Geary Jr.	Cash Entry	12 Stat. 566 (April 24, 1820)
					SE	NE				
					NE	NW				
39980	1/8/1890	6N	69W	5	W	SW	80	Thomas Geary	Cash Entry	12 Stat. 566 (April 24, 1820)
39958	11/10/1882	6N	69W	6		SE	160	David P. Brown	Cash Entry	12 Stat. 566 (April 24, 1820)
39962	1/23/1885	6N	69W	7	NE	NE	40	Polly Sims	Homestead Entry	12 Stat. 392 (May 20, 1862)
39981	1/15/1890	6N	69W	8	W	W	160	William Dunham	Cash Entry	12 Stat. 566 (April 24, 1820)
39960	12/15/1882	6N	69W	8	E	NW	80	Patrick Reynolds	Homestead Entry	12 Stat. 392 (May 20, 1862)



Patent Dates, Grouped by Decade:

- Pre-1880s
- 1880s
- 1890s
- 1900s
- 1910s
- Post-1910s

½ mile 0mile 1mile

1000ft 0ft 1000ft

1km 0km 1km

N W E S

Figure 2–4. Geographical Distribution of Historical Land Patents.

USGS TOPOGRAPHIC MAP
Horsetooth Reservoir, Colo
1962; photorevised 1975

In her memoirs, Lydia Bardwell Wathen (1936) recalls establishing a ranch in Spring Canyon in 1887. Although her family had homesteaded in several parts of the country, including Oregon and Kansas, Wathen was impressed with the area around Fort Collins and hoped to settle there one day. Entering the canyon during the spring of 1887, she was struck by the beauty of the many plum trees and flowering bushes. At that time, the quarries were "running full blast" and her husband, Stephen, like many other residents of the area who had farms, also worked in the quarries hauling rock and loading railroad cars. Wathen noted the existence of buildings related to the quarry activity, including the railroad depot, section house, boarding house, and Knights of Labor Hall. These features were all located at the original town site of Stout, south of the present reservoir area.

The Wathens used local stone to build a two-story stone farmhouse in Middle Glade, portions of which are now inundated by Horsetooth Reservoir (i.e., Inlet Bay). They raised cows and chickens, corn, wheat, and garden vegetables, and produced milk and butter (Ahlbrandt and Stieben 1987:343). When the Stout boarding house post office closed, that office was moved to the Geary Ranch and later to Wathen's Spring Canyon Ranch, where Stephen Wathen served as post master until the office was closed in 1908 (Ahlbrandt and Stieben 1987: 345). The two-story post office was a landmark within the valley, and Wathen also operated a small grocery from this location (Wathen 1936). The Wathen Ranch and the second Stout Post Office were recorded as Site 5LR9974.

In her memoirs, Jennie Tennant (1986) also recalled farming in Spring Canyon. Tennant, whose parents were Norwegian immigrants, moved to the area as a child. Living in the area during the 1920s and 1930s, Tennant asserted that "there was the constant threat of drought, frost, hail, disease, and insect plagues" (Tennant 1986: 43). In order to supplement the family income, the Tennants pursued such activities as selling cherries and trapping furbearing animals, while raising cows, chickens, corn, and garden vegetables.

Tennant attended Highland School, which continued to operate after Stout had already come to be regarded as a ghost town. Although the railroad receded, the school stayed open, serving local farming families. Except for two years during World War II, Highland School continued to provide local children with education until its sale in 1946. It served as the project office for Reclamation during the building of Horsetooth Reservoir (Tennant 1986; Bucco 1974: 334).

Further north, in the area near Arthur's Rock, John Kimmons homesteaded land in 1891 and raised cattle. In 1897, Kimmons traded his land with a farmer from North Park named John Howard, a Swedish immigrant. The Howard family eventually owned 3,600 acres in the area, operating the ranch for about 65 years. The children attended a schoolhouse in Soldier Canyon. This school closed in 1913 (Lory State Park n.d.).

Howard's son, Charles, later recalled that there were many unsuccessful attempts to homestead in the area, and that 160 acres were not enough in which to establish a profitable operation. Howard, who created a successful cattle ranch, took advantage of the introduction of dryland alfalfa to insure stability. He planted 200 acres of this crop and utilized natural runoff from Well and Nye Gulches as irrigation, although most of his farming was without irrigation. The introduction of alfalfa was one measure that gave ranchers economic stability. When other less successful homesteaders sold out, Howard was able to increase his holdings (Lory State Park n.d.; Watrous 1911: 136-137).

Until the 1920s, open range grazing was allowed in the area. In addition to cattle and alfalfa, the Howards, like most other settlers in the area, pursued other activities that added to their self-sufficiency, such as chickens, pigs, milk cows, garden fruits, and vegetables. The Howard family land is now partially encompassed by Lory State Park (Hutchinson 1983).

Examination of the 1885 Census of the State of Colorado reveals that many of those who homesteaded the area comprising Horsetooth Reservoir also worked in local quarries or other industries in the area. The Lamb family, including brothers Frank and Eugene, had come from Ohio, homesteaded and maintained a small quarry (Colorado Census 1885). In 1879, Swan Johnson, a Swedish immigrant, bought an established homestead and supported himself by working two quarries and raising cattle. Johnson's niece, Wilhelmina, and her husband John Soderberg, Sr., became partners on the ranch and raised cattle and hay. Edward and Bridget McCabe, English immigrants, homesteaded and farmed 800 acres in Soldier Canyon. McCabe also supported his family by working as a gardener on the campus of the state agricultural college (Ahlbrandt and Stieben 1987: 629; Choice Magazine, May 1981: 1(7)).

The first farmers in the region recognized that, with an average annual rainfall of about 15 inches, agricultural enterprises on the plains would require additional water obtained through diversion of existing water systems. Irrigation in northeastern Colorado began about 1859, when early pioneers in the Upper South Platte Basin plowed out small ditches and diverted water from the mountain streams. By early 1860, farmers had also dug ditches diverting water from the Cache La Poudre River. This water was used to aid in the production of small grains and some vegetables sent to the booming mining camps (Dille 1958: 5; Ahlbrandt and Stieben 1987: 38).

The first irrigation of the higher or second bench lands along the Cache La Poudre began with the Union Colony of Greeley in 1870. The colony was founded by Nathan C. Meeker, the agricultural editor of the New York Tribune, and his editor and publisher, Horace Greeley. When the Union Colony reaped a bounteous harvest from its irrigated land, other colonies soon followed, including the Agricultural Colony at Fort Collins and the Colorado-Chicago Colony near Longmont (USDI Bureau of Reclamation 1937: 6). These well-publicized irrigation ventures, together with Western boosterism, encouraged the rapid settlement of northern Colorado during the 1870s and 1880s. In turn, the new settlers initiated the development of even larger, more extensive irrigation projects (USDI Bureau of Reclamation 1949a: 6).

From the 1870s to 1910, the building of irrigation systems became a major industry in northeastern Colorado. The introduction of crops such as alfalfa, potatoes, and sugar beets, which required more intensive watering than products grown in earlier years, led to the development of irrigation systems by groups of farmers and large corporations. An elaborate system of canals and reservoirs, many of them jointly operated by several irrigation companies, successfully transformed the semiarid land of northeastern Colorado into some of the nation's most intensively cultivated farmland (Sherow et al. 1987; Ahlbrandt and Stieben 1987: 39). By 1910, northeastern Colorado's reservoir storage had reached nearly 600,000 acre-feet. World War I encouraged even further agricultural development in the area, as the country was called upon to supply food for other nations.

During the 1920s, however, the agricultural boom of northeastern Colorado began to fade. By 1920, European farmers had recovered from the war and prices for U. S. agricultural goods fell. Northeastern Colorado irrigators, who had expanded operations during the boom years, found

themselves overextended. The value of water shares, which had jumped during the war years, fell sharply by the end of 1921 (Mehls 1984b: 155).

Farmers were also plagued by water shortages. The building of northeastern Colorado's large-scale irrigation systems had occurred during a time of plentiful rainfall. In order to maximize profits, the irrigation companies had often spread the cost of the irrigation works over the largest possible acreage. During the dry years of the early 1930s, however, the irrigation companies found that they could not fully serve all of their subscribers. Northeastern Colorado irrigators, particularly those with junior water rights, often found themselves short of water (USDI Bureau of Reclamation 1949a: 3). In 1925, Colorado and Nebraska signed the South Platte River Compact, which guaranteed that Colorado farmers would not divert Nebraska's share of the South Platte River. The agreement worked well until the dry cycle began, and Colorado farmers suffered water shortages (Mehls 1984b: 157).

Also significant to the agricultural economy and irrigation needs of northeastern Colorado was the introduction of the sugar beet industry. In 1901, the Colorado Sugar Manufacturing Company opened a sugar beet factory in Loveland. In 1903, Fort Collins gained its own sugar beet factory (Ubbelohde et al. 1976: 266-267). Beet sugar factories also opened in Greeley, Eaton, Windsor, Fort Lupton, and Johnstown. The Colorado Agricultural College in Fort Collins also encouraged the planting of sugar beets and pioneered in the study of methods to improve the crop (Fleming 1985: 60).

The success of the local sugar refineries encouraged a type of farming that centered around the growing of sugar beets, which was more water intensive than raising wheat and corn. During years of low runoff, many farmers were forced to abandon the growing of sugar beets. In 1929, when the Smoot-Hawley Tariff raised the price of American sugar, local farmers were optimistic that prosperity was returning. However, those hopes were quickly dashed in October 1929, when the New York stock market collapsed and the nation slipped into the Great Depression. As unemployment lines stretched across the nation, local farmers faced rapidly declining food prices and an even further reduction in demand (Mehls 1984b: 156).

With the election of President Roosevelt in 1932 and the promise of a "New Deal," northeastern Colorado farmers turned to federal government programs for financial relief. Locally, the most influential federal agency was the Agricultural Adjustment Administration (AAA). In an attempt to raise commodity prices by limiting production, the AAA paid farmers not to produce above certain quotas. The AAA also purchased marginal farmlands in order to remove them from farm production (Mehls 1984b: 164).

2.2.1.3 The Colorado-Big Thompson Project

Of all the federal projects initiated in northern Colorado during the New Deal, however, none was more politically complex and technically challenging than the Colorado-Big Thompson Project. The largest public works water project initiated in the state during the Depression, the Colorado-Big Thompson Project was also one of the largest ventures ever undertaken by the United States Bureau of Reclamation (Ubbelohde et al., 1988: 317-318). The project enabled the diversion, capture, storage, and regulation for direct and indirect use of water of the Colorado, Big Thompson, Cache La Poudre, St. Vrain, Boulder, and South Platte Rivers and their tributaries for irrigation, domestic, municipal, industrial, power, and recreational purposes. The project, which took over 20 years to complete, diverted water from Colorado's Western Slope to

Eastern Slope water users. The primary purpose of the Colorado-Big Thompson Project was to provide a supplemental water supply for 615,000 acres of land in northeastern Colorado (Larimer District Court 1960).

Plans to bring Western Slope water to the Front Range did not originate with the Colorado-Big Thompson Project. As early as the 1880s, the possibility of transmontane water diversion in Colorado was being studied. In 1881, E. S. Nettletone, Colorado's first state engineer, made a preliminary survey to determine the feasibility of bringing Western Slope water to the Front Range. Nettletone's study, however, was unfavorable, and no work was done (Dille 1958: 10). In 1889, the Colorado legislature appropriated twenty thousand dollars for a survey by state engineer K. P. Maxwell to investigate the possibility of a tunnel that would divert water from Grand Lake on the Western Slope to the Front Range (U.S. Government Printing Office 1962: 5). One of Colorado's first large-scale transmontane projects took place in 1936, when water from the Fraser River was diverted through the Moffat Tunnel and a pipeline to Denver. The Jones Pass and Twin Lakes Tunnels were also completed in the 1930s (Ubbelohde et al. 1988: 316).

In 1933, a group of Greeley businessmen and farmers revived the idea of a transmontane water diversion to northeastern Colorado. The group, under the leadership of Greeley *Tribune* editor Charles Hansen, raised enough funds to hire two engineers, R. J. Tipton and L. L. Stimson, to evaluate the feasibility of diverting Western Slope water to northeastern Colorado. Presented in 1934, the Tipton report concluded that such a diversion was not only possible but also profitable.

In January 1935, representatives of local irrigation companies organized themselves as the Northern Colorado Water Users Association, and began a full-fledged campaign to gain federal support for the project. Project supporters included: Senators Edward P. Costigan and Alva B. Adams; Congressman Fred Cummings; Assistant Secretary of the Interior Oscar Champman, who was from Colorado; the Union Pacific and Burlington Railroad Companies; the Great Western Sugar Company; and Charles A. Lory, president of the Colorado Agricultural College. Local governments, chambers of commerce, and civic organizations also heartily endorsed the plan. By the end of 1935, the lobbying efforts had succeeded in persuading the U.S. Bureau of Reclamation to authorize a two-year study of the proposed project (Knight 1964: 325-326).

Critics of the Colorado-Big Thompson Project questioned the need for a federal project that would bring more water to farmers who were already receiving federal money not to raise crops. Environmentalists were alarmed by the plan to tunnel the water under Rocky Mountain National Park. And Western Slope farmers charged that the Front Range was taking their water. Backers of the Colorado-Big Thompson Project, however, argued that the project would eliminate the water shortages in northeastern Colorado and offer greater economic stability. They also lauded the project's hydroelectric generating capabilities and the large number of jobs created. In order to appease Western Slope farmers, the project backers also guaranteed that the project would include a storage reservoir on the Western Slope that would impound as much water there as was diverted to the Front Range (Ubbelohde et al. 1988: 318-320; Knight 1964: 326).

The Colorado-Big Thompson Project was authorized in the Interior Department Appropriation Act of 9 August 1937 (50 Stat. 595), and was set forth in Senate Document 80, 75th Congress. President Roosevelt signed the measure in December 1937. Also in that year, the Northern Colorado Water Users Association reorganized as the Northern Colorado Water Conservancy District by water users in the area to be served by the project. A contract was executed between the conservancy district and the United States in 1938, which provided for the use of water by

the district, repayment by the water users of a portion of the construction cost, and set forth the procedures for the operation and maintenance of the project facilities (USDI Bureau of Reclamation 1949a: 1).

Basically, the Colorado-Big Thompson Project diverts water from the Colorado River drainage in the vicinity of Granby and Grand Lake to Colorado's Front Range. On the Western Slope, the water is diverted into Granby Reservoir, then pumped into Shadow Mountain Lake, and from there it flows by gravity into Grand Lake. At that point, the water is tunneled under the Continental Divide through the 13.1-mile long, nine-foot wide Alva B. Adams Tunnel. Surfacing in the vicinity of Estes Park, the water then flows through a series of power plants, reservoirs, siphons, tunnels, and canals before reaching the farm ditches of northeastern Colorado (Ubbelohde et al. 1988: 320; USDI Bureau of Reclamation n.d.b).

The Colorado-Big Thompson Project was constructed between 1938 and 1959. Covering an area of approximately 250 miles, the project encompasses 13 reservoirs and regulating basins, 25 earth and rockfill dams and dikes, six power plants, three major pumping stations, 24 tunnels, 11 canals, 16 major siphons, eight penstocks, 785 circuit miles of transmission lines, and 43 substations and switchyards. Total project cost was estimated at $160,432,000 (U.S. Government Printing Office 1962).

Horsetooth Reservoir is one of the Colorado-Big Thompson Project's principal storage facilities on the eastern side of the Continental Divide. The reservoir measures approximately 6.5 miles long and ¼- to ¾-mile wide. At a maximum pool elevation of 5430 ft., the reservoir covers an area of 1,873 acres and provides for the storage of 147,322 acre-feet of water (USDI Bureau of Reclamation 1949a: 23, 1949b). Water stored in the reservoir supplies irrigation water for lands in the Cache La Poudre Valley.

The reservoir is located in a valley in the Rocky Mountain foothills approximately 4 mi. west of Fort Collins. The valley, which is oriented in a north-south direction between two nearly parallel hogback ridges, was formed by the erosion of soft shales. A hogback consisting of hard sandstone of the Dakota formation forms the eastern side of the reservoir. Originally, this ridge had three natural stream cuts made by Spring Canyon, Dixon Canyon, and Soldier Canyon Creeks, tributaries of the Cache La Poudre River. During the construction of Horsetooth Reservoir, Spring Canyon, Dixon Canyon, and Soldier Canyon Dams closed these V-shaped notches. To complete the reservoir, Horsetooth Dam and Satanka Dike closed off the northern end of the valley (Hagelin 1950: 1-2; USDI Bureau of Reclamation 1949a: 23).

Construction of Horsetooth Reservoir included the relocation of five miles of county road, the construction of four dams and a dike, and the excavation of about two miles of equalizing channels in the bed of the reservoir. The Colorado River watershed, located on the western side of the Continental Divide, provides the main source of water to Horsetooth Reservoir. Final delivery of this water to Horsetooth Reservoir is made through the Charles Hansen Feeder Canal (Tunnel No. 5), located on the southwestern end of the reservoir. In addition, three streams also flow into Horsetooth Reservoir: Spring Canyon, Dixon Canyon, and Soldier Canyon Creeks. Each of these streams had prior water rights that had to be provided for during and after the construction of the reservoir (Hagelin 1950: 6-7).

The Horsetooth Dam and Satanka Dike were constructed during 1946-1949 to close the valley between the hogback ridges at the northern end of the reservoir site. Horsetooth Dam is a zoned and compacted earth and rockfill structure, with a maximum height of 154 ft., a crest length of

1,600 ft., and a volume of 1,872,000 cubic yards. The outlet for the Charles Hansen Canal is located in Horsetooth Dam.

Satanka Dike is located approximately 400 ft. west of Horsetooth Dam. The dike is a zoned and compacted earth structure with a maximum height of 20 ft., a crest length of 350 ft., and a volume of 5,000 cubic yards. Four feet lower than the four main dams, Satanka Dike serves as the reservoir's emergency overflow.

Soldier Canyon Dam was constructed during 1946-1949 to close the opening made through the easterly hogback ridge by Soldier Canyon Creek. The dam is situated about 4,000-ft. southeast of Horsetooth Dam. It is a zoned and compacted earth and rockfill structure with a maximum height of 234 ft., a crest length of 1,424 ft., and a volume of 3,222,000 cubic yards. An outlet tunnel that diverts water into the Dixon Feeder Canal is located in the right abutment of Soldier Canyon Dam.

Dixon Canyon Dam is located about 2.6 mi. south of Soldier Canyon Dam. It was constructed during 1946-1949 to close the stream cut made by Dixon Canyon Creek. It is a zoned and compacted earth and rockfill structure with a maximum height of 240 ft., a crest length of 1,235 ft., and a volume of 2,940,000 cubic yards. No outlet was provided at this dam.

Spring Canyon Dam was built during 1946-1948 to close the Spring Canyon Creek stream cut. Spring Canyon Dam is located about 1.7 mi. south of the Dixon Canyon Dam and approximately 5 mi. southeast of Horsetooth Dam. It is a zoned and compacted earth and rockfill structure with a maximum length of 215 ft., a crest length of 1,150 ft., and a volume of 2,040,000 cubic yards. There is no outlet at Spring Canyon Dam.

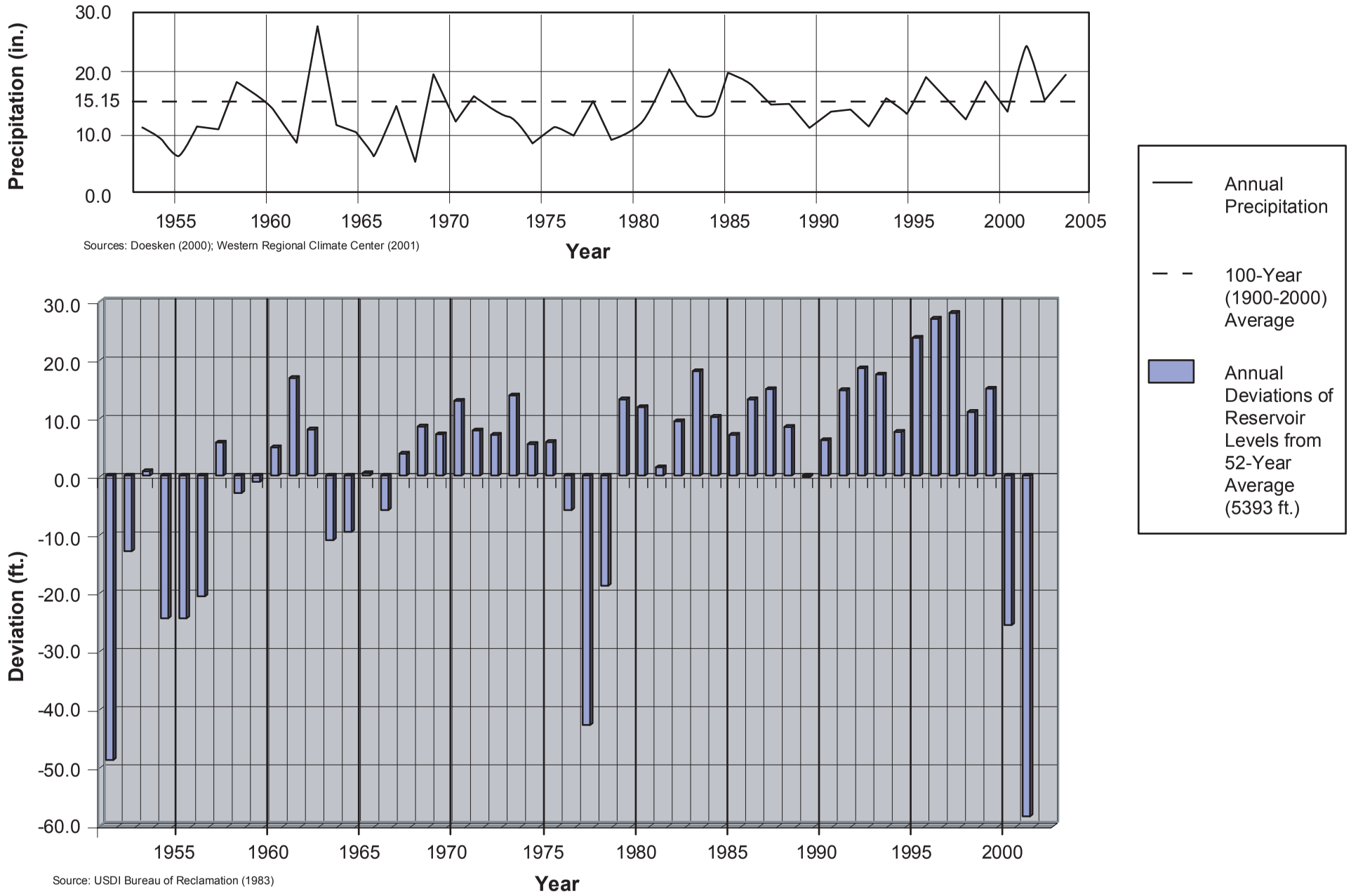
The construction of Horsetooth and Soldier Canyon Dams was contracted by the joint venture of Grafe-Callahan Construction Company, Gunther and Shirley Company, and W. K. McIlyar. Hinman Brothers Construction Company and Rhoades Brothers & Shofner built the Dixon Canyon and Spring Canyon Dams (Hagelin 1950: 9). The construction of the reservoir and associated structures provided many jobs for local residents. Filling of the reservoir began in January 1951 (U.S. Government Printing Office 1962: viii).

Water levels in Horsetooth Reservoir have fluctuated since it was filled, these fluctuations resulting from variations in inflow (climatic changes) and outflow (demand). Figure 2-5 graphically displays deviations (in feet) of reservoir levels from a 52-year average level of 5393 ft. Mean annual precipitation values are overlain on this graph. A close correlation is apparent between reservoir levels and precipitation values in wetter years (e.g., the early 1960s, early 1970s, and the 1980s and 1990s) and drier years (e.g., the late 1950s, late 1960s, and late 1970s). In 1989, the outflow tunnel was closed for repairs. In 2001-2003, the reservoir was intentionally drawn down for construction, the lowered lake levels amplified by severe drought conditions.

2.2.2 Previous Research

Beginning in the mid-1970s, several cultural resources inventories were conducted in the Horsetooth Reservoir project area. In 1976, Reclamation conducted a survey for an off-road vehicle area and recorded no sites. In 1989, Powers Elevation conducted an inventory of the north shoreline of Horsetooth Reservoir, which resulted in the identification and evaluation or reevaluation of 45 cultural resources (Mutaw et al. 1990). In 1990, Powers Elevation conducted

Figure 2-5. Horsetooth Reservoir Levels (1952-2003) Compared Against Annual Precipitation for Fort Collins.



an inventory of the south shoreline of Horsetooth Reservoir and recorded 25 sites and two isolated finds (Mutaw et al. 1991). Also in 1990, Powers Elevation conducted a survey of three segments of County Road 38E and recorded two cultural resources locations (Harrison 1990). Reclamation also surveyed a portion of the County Road 38E improvements in 1990 and recorded no sites. In 1994, Reclamation surveyed a recreation field southwest of Inlet Bay and recorded no sites. Reclamation has also performed documentation and evaluation of the reservoir and its various features (Pfaff 1999; Pfaff and Simonds 1998).

In late 2000, URS surveyed approximately 1,770 acres in the exposed pool area of Horsetooth Reservoir (Mutaw 2001). The survey identified and evaluated, or re-evaluated, 43 sites and 10 isolated finds. All of the sites date to the historic era and are generally associated with stone quarrying (1880s-1920s) and agricultural (1880s-1940s) activities prior to construction of the dams and reservoir, or features related to construction of the dams and reservoirs in the late 1940s. Two of the newly identified sites (5LR9961 and 5LR9974) were recommended as eligible for listing in the National Register of Historic Places under criterion d. To mitigate possible adverse effects to these two sites, it was recommended that data recovery be performed before the reservoir is refilled. Although URS had originally concluded that Site 5LR9949 was not eligible for the National Register, Reclamation determined in consultation with the Colorado SHPO that the site was eligible. Data recovery at this site before refilling of the reservoir was recommended.

2.2.3 Site Descriptions

2.2.3.1 Site 5LR9949

This site is a sandstone quarry with multiple features, which covers an area of about 1.8 acres. It is located near the toe of a ridge in Eltuck Bay at the northern end of the reservoir (Figure 1-1). It extends east-to-west along the ridge toe and includes a quarry area and associated rubble (100 ft. x 100 ft.), a multi-room structure (180 ft. x 20 ft.), a single-room structure (40 ft. x 20 ft.), a stacked stone retaining wall (15 ft. x 1 ft.), and a long, loosely stacked sandstone wall (302 ft. x 1 ft.) (Figure 2-6). During construction of the reservoir, any remaining super-structural elements related to this site would have been razed. A sparse scatter of artifacts were found on the site, including fragments of glazed white ware ceramics, milled lumber, metal fragments, and a possible stove body. Given the proximity of the quarry cut (less than 50 ft.) and the layout of the structural foundations, it is likely that this site was a processing plant for the stone quarry.

2.2.3.2 Site 5LR9961

This site is a discrete trash dump, located towards the middle and western side of Horsetooth Reservoir, at the break in the slope between the steep hogback and the relatively flat area to the east (Figure 1-1). The dump measures about 3 ft. in diameter and is distinguished by a pit filled with historic materials related to domestic activities (Figure 2-7). The materials appear to represent a discrete dumping episode of unknown age. The setting is in an area that is stair-stepped from erosion, which is likely to be the cause of the exposure of these materials. At the time of recordation, there was evidence of recent excavation near the pit and disturbance of the materials in it. Cultural materials include a roll of barbed wire, numerous glass bottles and bottle fragments, white glazed earthenware sherds from plates, cans, shoes, bed springs, jars, and nails.

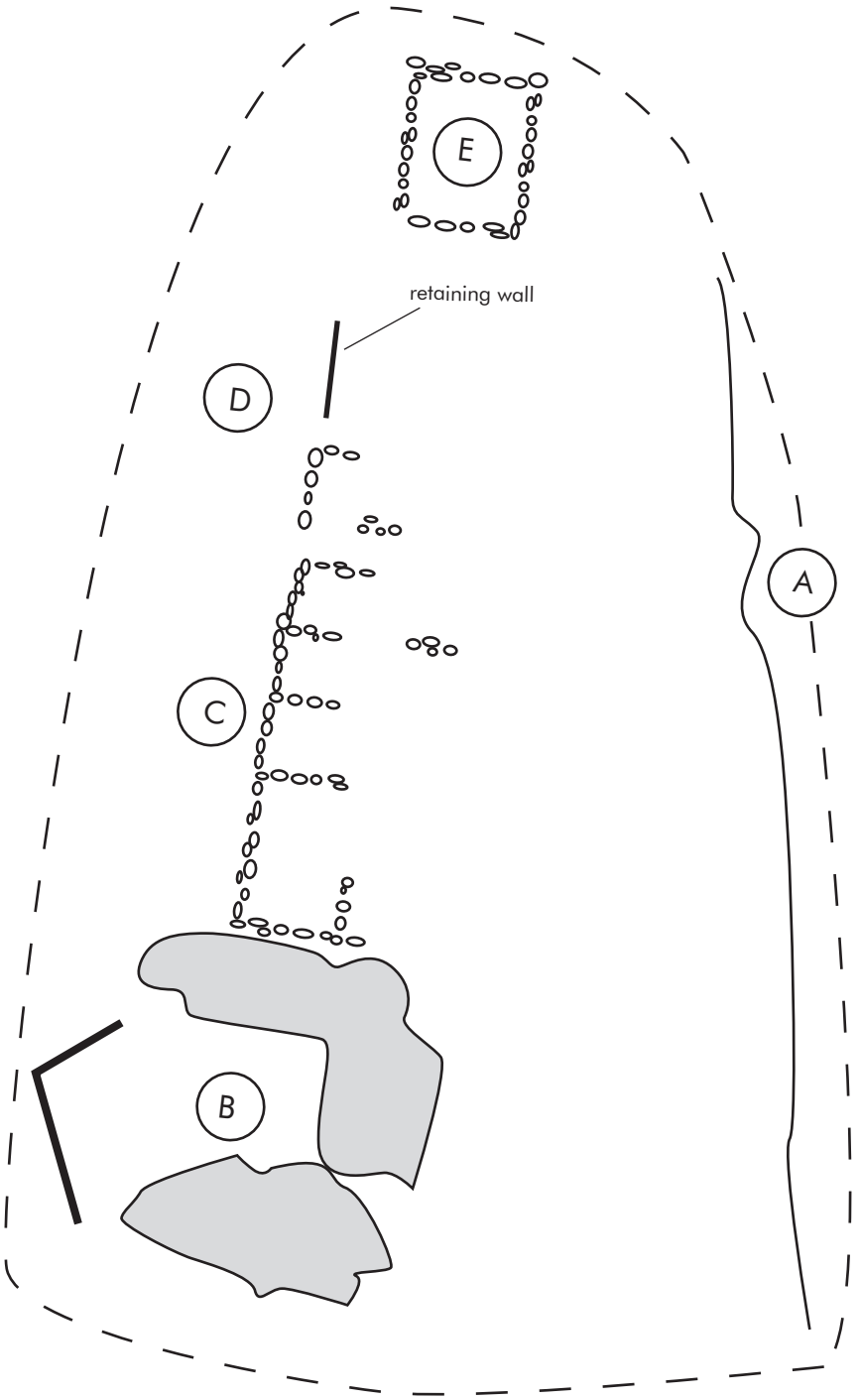
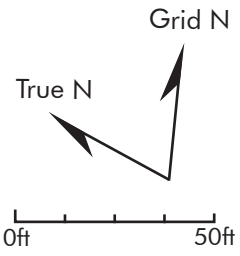


Figure 2–6.
Plan View Sketch Map of 5LR9949.



site boundary
quarry cuts
rubble
A-E Features
structural remains

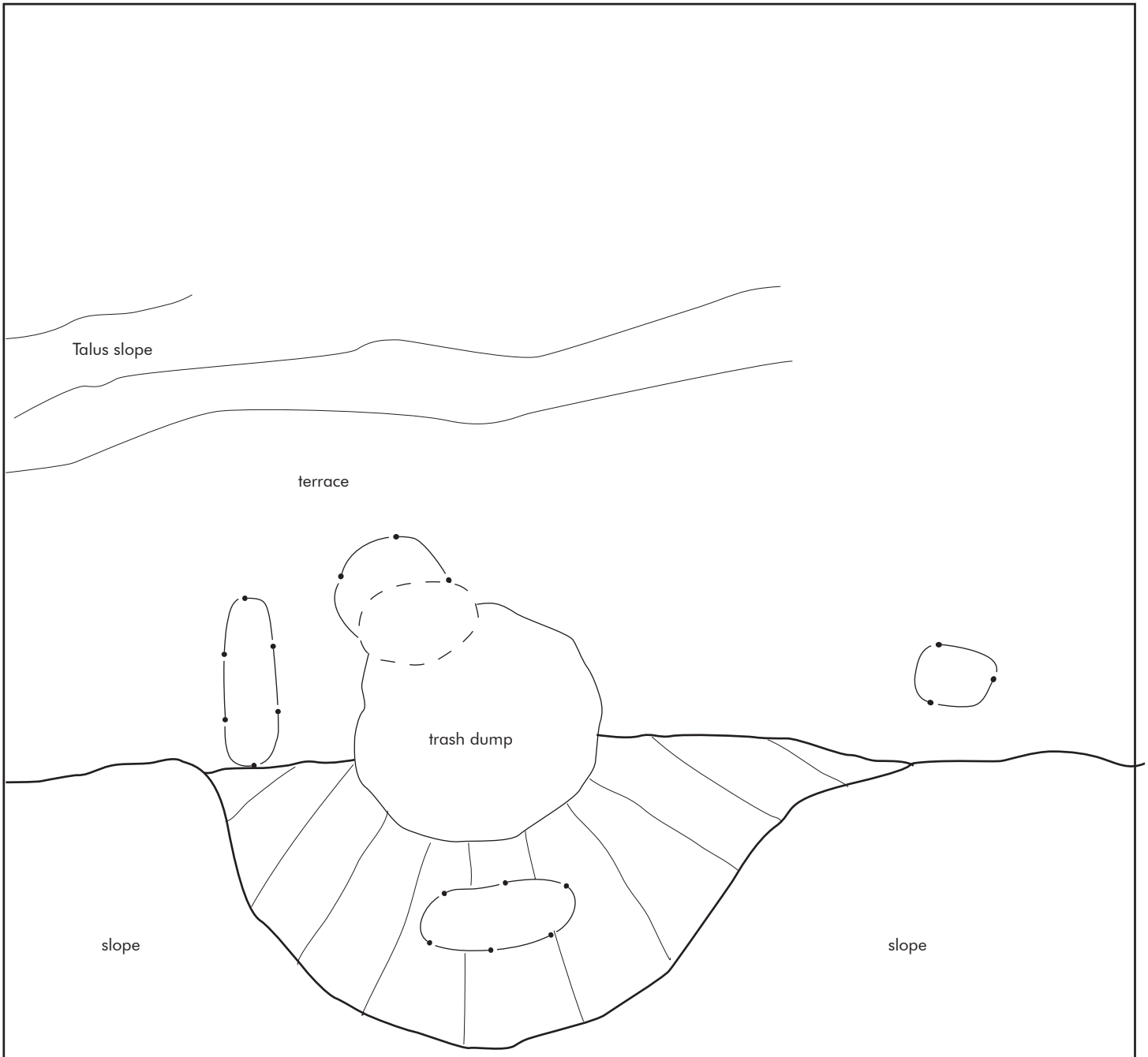


Figure 2–7.
Plan View Sketch Map of 5LR9961.

Four shovel tests were excavated at the site to determine if materials were present in the matrix surrounding the pit in which the artifacts had been dumped. A small trench excavated above the concentration, to the south on a terrace, produced no artifacts. Another pit was dug adjacent to a looter hole at the southwest corner of the trash pit. This produced wire cut nails, burnt wood, and an ash lens. To the east of the dump along the cutbank a shovel test was excavated into the trash dump, underneath the visible materials, revealing that the cultural materials extend below what is now exposed. Another shovel test was excavated 3 m north of the dump, but no artifacts were found. The testing confirmed that the materials were confined to the pit in which they are buried.

The site is at least 200 ft. from quarry sites 5LR1420 and 5LF1422; as such, it is problematic as to whether it was associated with either one or both of those sites. In any case, the materials in the dump appear to be domestic refuse.

2.2.3.3 Site 5LR9974

This site consists of stone slabs and bricks, scattered over an area of about 4 acres, on a gentle slope in Inlet Bay, towards the southern end of Horsetooth Reservoir (Figure 1-1). Three distinct clusters of materials (Features A, B, and C) are evident (Figure 2-8). The location of these materials roughly corresponds with that of structures shown on the 1906 and 1908 U.S.G.S. maps and identified as the Town of Stout. This would have been the second location of the Stout Post Office on the Spring Valley Ranch operated by Steven A. Wathen.

Shovel tests were excavated within each feature. At Feature A, a shovel test measuring 25 cm x 50 cm was excavated to 30 cm and produced flagstone, a very dark gray organic soil containing charcoal, milled lumber pieces, and brown bottle glass sherds. At Feature B, a shovel test measuring 25 cm x 25 cm was excavated to 25 cm and encountered subsurface air pockets related to the surface flagstone, wire cut finishing nails, rifle cartridges, and milled lumber pieces. At Feature C, a shovel test measuring 25 cm x 25 cm was excavated to 15 cm and produced building stone and bricks and a large amount of mortar. These materials appear to represent an intact buried deposit that is related to the second incarnation of Stout.

The site is located nearly 2,000 ft. from any known quarry. As such, its purpose was probably commercial or domestic.

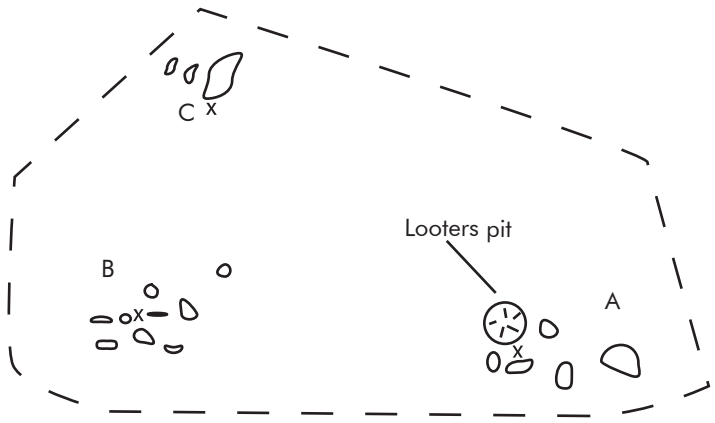


Figure 2-8.
Plan View Sketch Map of 5LP9974.

— — site boundary

A-C Feature

Pipe

x Test pit

Plan North

0ft 50ft

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